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ABSTRACT

This learning module, which is intended for use in inservice training for vocational rehabilitation counselors, deals with procedures for teaching clients behaviors that they are not presently exhibiting. The following training strategies are covered: prompting (verbal prompts, modeling, and physical guidance); fading; discrimination training; shaping; chaining (performing a total task, forward chaining, and backward chaining); and additional strategies of imitation training, generalization training, and response differentiation. The procedures described can be applied in the teaching of skills needed in the following areas: independent living, vocational, pre-academic, socialization, and language. The module provides an opportunity for users to write and implement programs and use the techniques presented. Four self-tests are also included. (MN)

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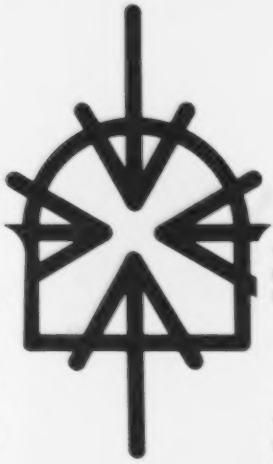

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REHABILITATION ASSOCIATE
TRAINING FOR EMPLOYED STAFF

Teaching New Behavior (RA-7)

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TEACHING NEW BEHAVIOR

by

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Produced by
R.A.T.E.S.

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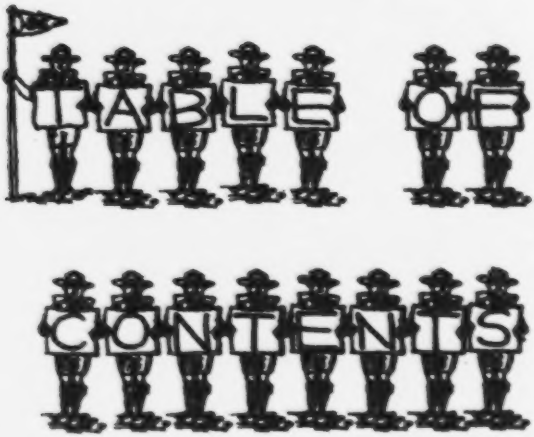
REHABILITATION ASSOCIATE TRAINING
FOR EMPLOYED STAFF

MODULE: RA-7 Teaching New Behavior

DESCRIPTORS: *chaining, discrimination training, discriminative stimulus, fading, generalization, shaping, successive approximations, prompting, task analysis, response differentiation*

OVERVIEW: The module on Teaching New Behavior will acquaint staff with several procedures for teaching clients behaviors which they are not presently exhibiting. Staff will learn to use shaping, chaining, fading techniques, and programmed instruction. These procedures can be applied to teaching skills in various areas: independent living, vocational, pre-academic, socialization, language, etc. This module will present examples of using these procedures to teach such behaviors. Staff will also be instructed on techniques to use to assure that a newly acquired behavior will be performed in various settings (generalization), or will only be performed in the specific setting in which it is desirable (discrimination). Individuals completing the module will write and implement programs, using the techniques they have been taught, for clients with whom they work.



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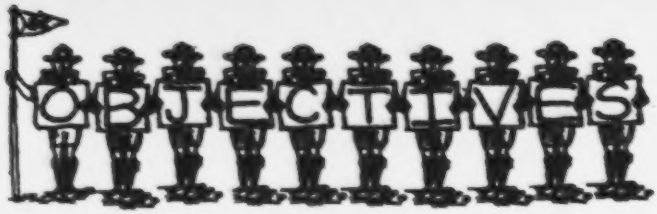


BEHAVIOR

1 Student will define each of the following procedures, including specific processes and when each procedure is used:

Prompting (verbal, modelling, physical)
Fading
Discrimination training
Trial and error
Fading of redundant stimuli
Easy to hard sequence
Delay of prompts
Matching to sample
Oddity
Shaping
Task analysis
Total task
Forward chaining
Backward chaining
Imitation training
Generalization training
Response differentiation

2 Student will write a program to teach a task which will provide evidence of each of the following:

Prompting
Fading
Discrimination training
Shaping
Task analysis
Generalization training
Response differentiation

3 Student will demonstrate additional knowledge of use of each of the techniques for teaching new behavior.

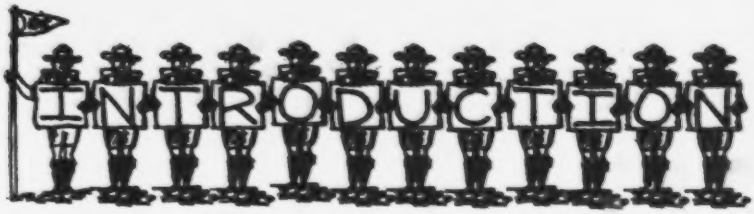
EVALUATION

1 At least 80% correct on written test requiring:

A. Definitions
B. Naming of procedure illustrated by an example.

2 Tasks to be trained will be listed in test question. Six of the seven required elements must be listed in the procedure.

3 True/False questions.



Individuals working in the field of rehabilitation are generally faced with one or more of the following situations:

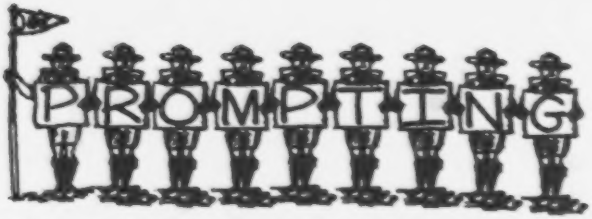
1. Client(s) do not do certain behaviors at all (behavior must be taught).

2. Client(s) do not do certain behaviors enough (behavior must be increased).

3. Client(s) do certain behaviors just right (behavior must be maintained).

4. Client(s) do certain behaviors too much (behavior must be decreased).

This module is directed toward the first of these situations and involves *methods for teaching new behaviors*. Procedures for doing this will be discussed below and will include prompting, fading, shaping, chaining, discrimination training, imitation training, and generalization training.



Unlike the tasks of increasing, decreasing, or maintaining *existing* behaviors, teaching a new behavior is particularly difficult because the behavior initially does not exist at all. You can't just reinforce it.

A prompt is one thing you can do to *bring about* a behavior in a client. It *cues* the behavior.

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What is a prompt ?

What you do to prompt generally falls into three categories or levels:

1 verbal prompting

2 modelling

3 physical guidance

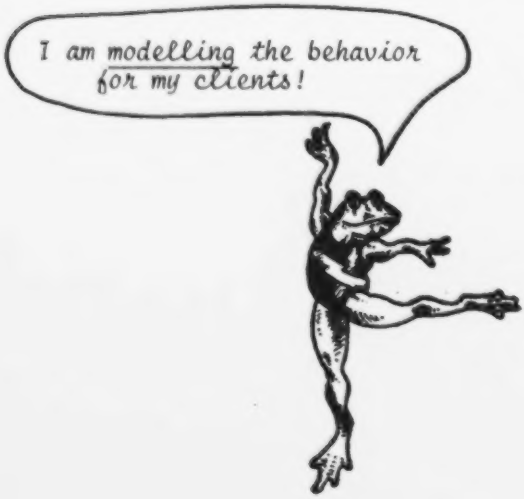
In the first level, *verbal prompting*, you give the client whatever *instruction* it takes to bring about the behavior. If, when you say, *"Saw the boards,"* and Joe just stands there, you might say, *"Pick up the saw,"* as verbal help to do the behavior. When someone does a favor for a client and you say, *"What do you tell the lady?"* that is a verbal prompt. A verbal prompt is something you say that makes the behavior easier for the client.

An example of a verbal prompt.

What is a verbal prompt ?

Clear

The important thing to keep in mind with verbal prompts is that they must be *clear*. The client cannot do the appropriate behavior if he does not understand your instructions.



There are times, however, when clear instructions are not enough and the behavior does not occur. This brings us to a second level of prompting, *modelling*. In modelling, you *show* the client what you want done. The coach says, "*Do it like this*," as he shoots a basket. You give George a completed circuit board. You show Mark how to sweep the floor. These are all prompts that typically give more help to the client than verbal instructions. They provide more *power* in bringing about appropriate behavior.

What is modelling ?

Physically moving the client through the response.

If the first two levels of prompting do not work (the behavior does not occur) we can get even more power through *physical prompts*. With physical prompts, you actually move the client through the action of completing the desired response (i.e., you move his hands for him.) When you take the client's hands in yours and help him write his name, that is a physical prompt. Physically prompting a client learning to fold laundry might mean grasping his hand and making his hand pick up the correct corner. These physical prompts generally provide the client with enough power to do the task.

What is physical prompting ?

All of these levels of prompting, then, provide us with the "power" to bring about behaviors. *The basic strategy is to use only as powerful a prompt as is necessary to elicit the behavior.* For each behavior, our goal is to always have the client do as much of the behavior as possible on his own. If you use too powerful a prompt, you are robbing the client of his independence. If you use too little, the behavior won't happen. The client will tell you by his progress of lack of it what he needs in the way of prompts. This is really an act that comes with practice. You will want to be very aware of the signals the client is sending in order to use prompts effectively.

Use the lowest level prompt necessary to elicit the behavior!

For example, you may give *instructions* to do a behavior (i.e., steps to sweeping a work area) if you see that it isn't working, you quickly move to a model and then if you see that isn't working, you may provide physical guidance. At whatever level of prompting you are at, once you see that it is working, you want to move back to levels with "less power" until the client is doing the behavior independently.

What is the basic strategy in prompting ?

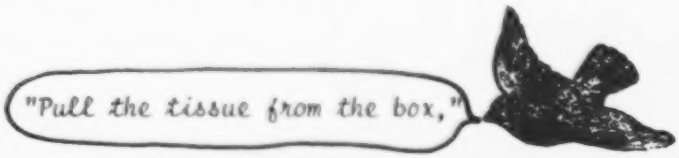
As indicated above, prompts can be useful in bringing about new behavior. It is not feasible, however, to follow a client into the "real world" forever providing a multitude of prompts. This is also not desirable, as we do not want the client to become dependent upon prompts. We just want the prompts to help teach the behaviors.

Thus, we must introduce a new term called *fading*. Fading is *the process of gradually giving less and less help (prompts) until the client can do the behavior independently*. A physical prompt that starts as a hand-over-hand to get the coat zipped, changes to just a touch at the elbow to accomplish the same thing. The touch is still help, but not as much as a full physical prompt. This fading of physical prompts is also known as *graduated guidance*. This graduated guidance is useful, for example, in assisting low functioning clients in assembly tasks. You may grasp both of their hands to enable them to do the task; then assist them by grabbing the forearm; then assist them by grabbing them behind the elbow; then provide no physical guidance at all.

Modelling can also be faded. A model for name writing can be total ("MARY") and go to ("MAR"), to ("MA"), and finally to ("M").

Mary	Mary
Mar	Mary
Ma	Mary
M	Mary

A verbal prompt can begin as a full instruction,



and progress to

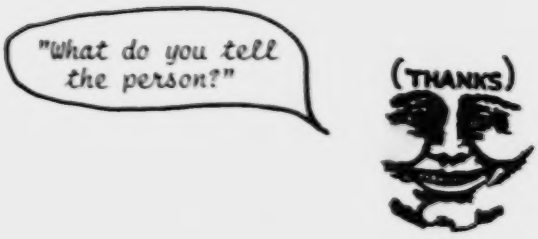
to

The whole idea is to *use the prompts to get the behavior started and then fade out the prompts* so that the behavior occurs on its own.

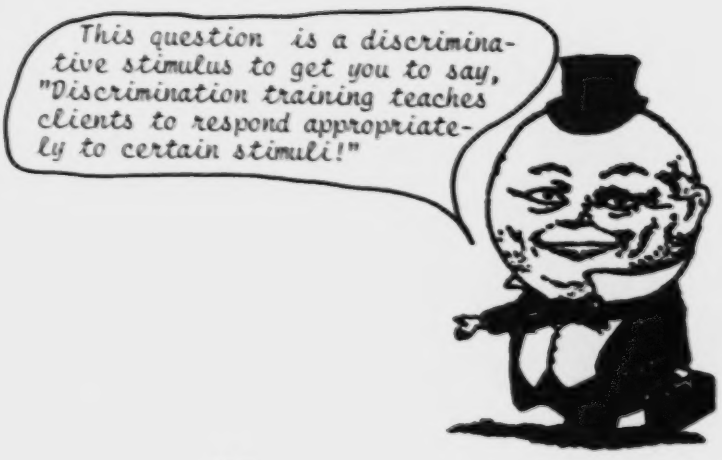
What is fading ?

Often clients do not make appropriate responses because they are not responding appropriately to stimuli. That is, a certain stimulus is not serving as a discriminative stimulus (it does not cue the response which will be reinforced). *For example*, in the situation above, the act of the person doing a favor for the client did not cue the response *"Thank you"* by the client (as it should have). Thus, you give an *irrelevant cue* to bring about the response, such as, *"What do you tell the person?"* It's irrelevant because it should not *normally* be needed in the situation. Thus, in teaching new behaviors, we may also at times, do some *discrimination training*. As you may have guessed by now, this is training which teaches clients to respond appropriately to certain stimuli to get the stimuli functioning as *discriminative stimuli*.

Discrimination training teaches a client to respond appropriately to certain stimuli.



What is discrimination training ?

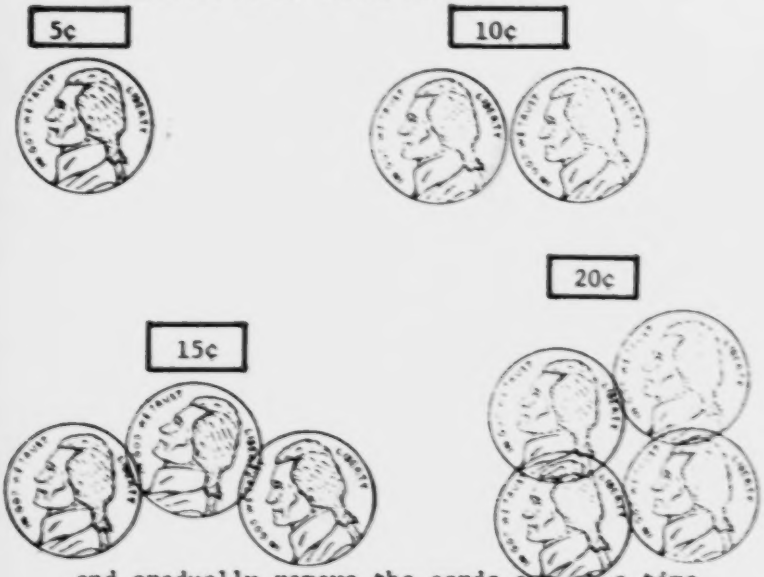

This question is a discriminative stimulus to get you to say, "Discrimination training teaches clients to respond appropriately to certain stimuli!"

The following are strategies used in discrimination training:

a. *trial and error*: relevant and irrelevant stimuli are concurrently presented to the client and the client is reinforced each time he picks the correct one. *For example*, in teaching coin recognition you may present a nickel and a dime and say,

"Which one is the dime?"

b. *Fading of redundant stimuli*: additional but redundant stimuli can be used to simplify the discrimination, and then these can be gradually faded out (another example of fading). *For example*, in teaching a client to count nickels, you may place the amounts on cards above the nickels:



and gradually remove the cards one at a time.

c. *Easy-to-hard sequences*: start with very obvious discriminations and gradually make them more exacting; i.e., the client responds to a stimulus which is vaguely similar to red, then one *more similar* to red, and finally red itself. (This is actually *shaping* which will be discussed in more detail later.)

Another example would be in teaching an individual to count by fives to 100 (i.e., counting nickels). You may start with them counting quarters (counting by 25's), then dimes (counting by 10's) and then finally the nickels. The earlier tasks of counting quarters and dimes are easier and contain many of the same responses needed in counting nickels.

25 50 75 100

10 20 30 40 50 60

28 5 10 15 20 25

Prompt immediately.	*Delay prompt 1 second.*	*Delay prompt 5 seconds.*
1	2	3

d. <u>*Delay of prompts*</u>: prompt the client immediately on the discrimination, then delay the prompt for one second, then for five seconds, etc., until the prompting is not needed. Verbal prompts work well here i.e., waiting for longer durations before giving the verbal prompt. Essentially you are increasing the time between the client's opportunity to respond and when you give the prompt.

A good example would be in giving verbal prompts to help a client count coins. You may at first count *with* the client, then wait one second before helping the client with each counting response, then two seconds, etc.

e. *Matching-to-sample*: provide a separate sample of the appropriate stimulus and then gradually fade this out. *For example*, in teaching coin recognition, present that client with a dime and a nickel, and ask, *"Which is the dime?"* Show the client a separate dime as a sample. Then, gradually fade out the sample dime. This is also an example of fading and is similar to fading of redundant stimuli, only the redundant stimulus is an exact model of the discriminative stimulus being trained.

Which is the dime?

Here is a dime.

Which is the dime?

f. *Oddity*: make the relevant discriminative stimulus the only odd one in a group and have the client choose it. Gradually reduce the degree to which the other stimuli are different. An example would be presenting one dime and three pennies and asking which is the dime; one dime and three quarters; one dime and three nickels, etc. Then maybe one dime and some foreign coins which are very similar to the dime which makes the discrimination more precise.

Which is the dime?

Which is the dime?

Which is the dime?

Can you list the methods of discrimination training ?

Good !

Can you list how they are used ?

(Which of the above strategies did we just use?)

Remember above, under discrimination training, where we talked about using easy-to-hard sequences? This is an example of *shaping*. We reinforce responses that are closer and closer to what we want. This is also called the method of *successive approximations* and is another way to teach behaviors. We reinforce approximations of a response we want, but only as they get successively closer to the response we want.

– we reinforce
– approximations
– of a response we want,
– only as they get closer
– to the response we want!

What is shaping ?

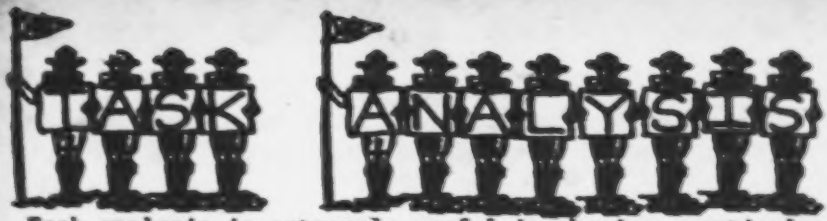
A good example of this is teaching speech. The first time a baby says, "*da*," we praise the heck out of him. Later, we praise the child for "*da-da*," and finally "*daddy*" (improper shaping is why older kids often use child-like speech. They were not reinforced for closer approximations to more adult speech.)

Praise [reinforce] successive approximations to the response you want!

The case of George, a client in a workshop, is another example of shaping. George never works more than two minutes at one time. Your initial step would be to reinforce him for every two minutes he works without leaving the work station. When he is doing this consistently, raise the criterion to two and a half minutes, then three, etc.

In another example, Robert is supposed to thread nuts on bolts, but he doesn't do it. He might be able to earn the reinforcer for setting the nut on the end of the bolt at first, then for screwing it part way down, then the whole way.

Basically, you reinforce a behavior that a client does (or that can be prompted) that may be only *vaguely* similar to the desired response. This might just be an attempt at the response (i.e., saying "ed" for "red"); it might be a prerequisite for the response (i.e., standing before walking); it might be the first step in a series of responses in order to complete a response.



Task analysis is extremely useful in shaping, particularly in the last example above when you are shaping *steps* in a series of responses. In task analysis, the behavior is broken down into its component parts (this is explained in detail in a separate module).

For example, with Robert learning to thread nuts on bolts, a task analysis might be

1. Pick up nut with thumb and forefinger of less preferred hand.
2. Pick up bolt in preferred hand, holding it by head with the stem pointing up.
3. Place nut on bolt
4. Turn nut with thumb and finger of less preferred hand.
5. Lift fingers and repeat turning.
6. Lift fingers and repeat turning.
7. Lift fingers and repeat turning.
8. Drop completed assembly in box.

With a task analysis in which you are going to shape steps in a task, there are three formats to choose from in order to teach this behavior. You could use what is called total task presentation. This means you would have Robert *do all the steps on each trial and help him as much as necessary for each step*. You would use verbal demonstration, and physical prompts as described earlier in the section on prompts. As Robert gets better and better, you would give him less and less help. He would be prompted through the entire sequence each time.

What is total task presentation ?

Another possibility would be to use *forward chaining*. This means you would *teach only the first step*, picking up the nut, *using as much prompting as necessary until he could do it completely independently. Then you would have him do the step he knows and teach the next one in the same way*, thus chaining the steps together into a single behavior. In Robert's case, you would teach him, using prompts, to pick up the nut. When he could do that independently, you would have him pick up the nut. When he could do that independently, you would have him pick up the nut and start to teach picking up the bolt. You would continue this until he could do the entire chain. This procedure could be used to teach behaviors like dressing. After you teach putting on a shirt, you might follow this with putting on jeans, so the two things will happen together.

What is forward chaining ?

Another possibility is *backward chaining*. This means the first step you teach is the last one in the task analysis. You would actually *do all the steps and then teach* Robert the *last step for each trial* i.e., you would pick up the two pieces, screw the nut down and he would put it in the box. When he would do this last step independently, you could do all but the last turn of the nut; teach him to do that and have him put it in the box. If you were teaching a more complex chain like floor mopping, you do not have to mop the entire floor for each trial. You would probably start a backward chaining procedure by teaching him where and how to put away the bucket.

What is backward chaining ?

The decision to use forward chaining, backward chaining, or total task presentation as your choice depends on you, the task being taught, and the client. Whichever you choose, take data. If one format is not working, you have some alternatives available. You do not have to give up. The client can learn the new behavior if you are smart enough to teach it. These 3 formats, *total task*, *forward*, and *backward chaining* all can be used to teach clients things they have never done before.

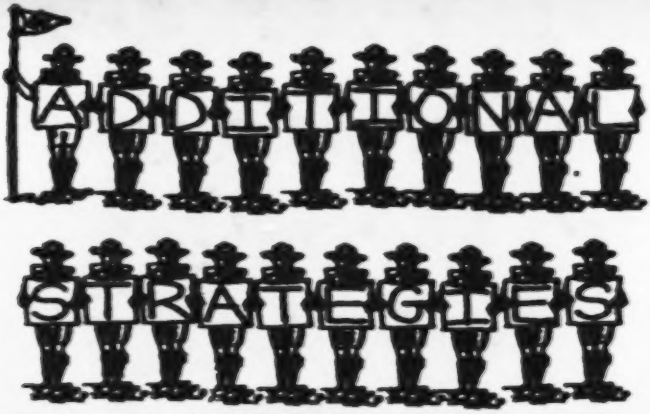
List 3 formats that can be used when shaping a task via its steps.

1

2

3

The tricky part of shaping is to raise the criterion appropriately. If you go too fast, the client will stop progressing. If you go too slowly, the progress will be slower than necessary. Again, as with fading prompts, *the client's progress or lack of it will tell you how fast to go*.



There are several additional strategies we can discuss which supplement the above approaches to teaching new behaviors. These include *imitation training*, *generalization training*, and *response differentiation*.

Imitation training: There may be times in teaching new behaviors when it is helpful to you to model responses for clients that you want them to imitate. As a basis for this, imitation training is often necessary. Where client imitative behavior does not occur, you can train it by conducting training sessions in which you reinforce clients for whenever they imitate any of your responses. Prompting and shaping may be useful here. The end result is that *the client will imitate your response, which will then be useful in teaching other new behaviors*. Parents use imitation training frequently by reinforcing their children for imitating their responses (waving "bye-bye," etc.). Once the child gets into the habit of imitating the parent, many new behaviors can be quickly taught.

What is imitation training ?

Generalization training: **Behaviors developed in a training environment (e.g., work behavior) are useless unless the client generalizes and uses them in other appropriate settings (e.g., competitive employment). Situations are numerous in which clients learn to do behaviors only in the training room and the behaviors are not done anywhere else.**

To facilitate generalization, the following should occur in training:

- When training, emphasize elements and discriminative stimuli involved in the training situation which are common to more natural situations. Try to use as many *relevant stimuli* as possible.

  You may use irrelevant stimuli in training the task, but must eventually remove these so that only relevant stimuli are used that actually exist on the real job. *For example*, you may tape off sections of a floor to teach sweeping dirt into piles as part of janitorial training. This is an irrelevant cue, however, that cannot always be done when one is a janitor in a factory.

- Gradually change the amount of reinforcement you give to levels representative of what really occurs in the "real world." In initial training you may need to give lots of reinforcement (*CRF, continuous reinforcement*); but must gradually get a client on a level that is realistic of a job he may obtain (*intermittent reinforcement*).

  In training the client in sweeping, you give lots of reinforcement while the task is being learned, but must fade this out as all that can be expected in the competitive job is the periodic paycheck. The client may fail on the job if he/she expects a more frequent level of reinforcement.

- Train responses under a variety of conditions. This will give the client experience in responding to novel situations. The client should be trained in sweeping rooms arranged in different ways, which vary according to size, etc.

- When irrelevant discriminative stimuli are needed, consider those that can be easily transferred to new situations. Tape on a handle of where to hold a broom can be used anywhere.

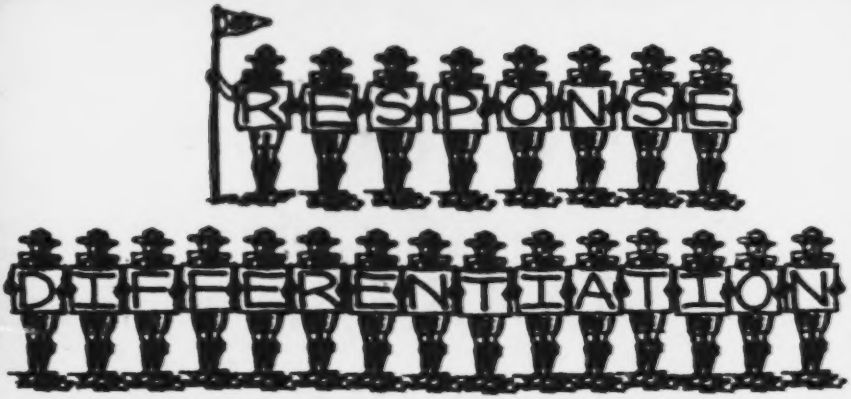
★ relevant stimuli

★intermittent reinforcement

★variety of conditions

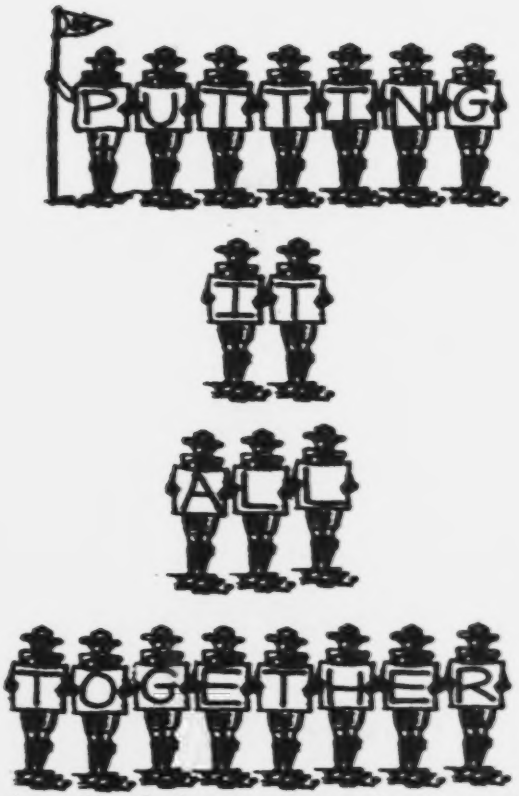
★ easily transferred

How do we facilitate generalization ?

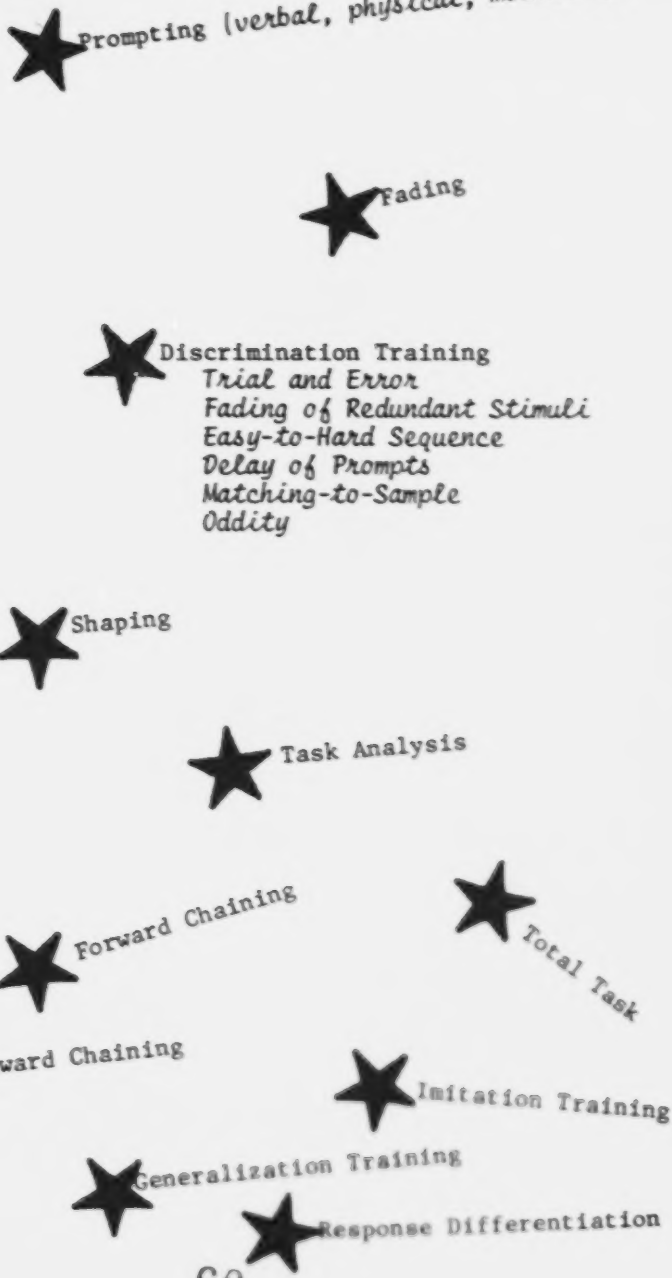


Once new behaviors have been taught, they often occur in "rough" form. To polish responses, we use *differential reinforcement*. We *reinforce only one member of the response class* (the one we want) *and ignore all others* (i.e., only the correct way to swing a bat). In this way, the reinforced response becomes differentiated and occurs more often than other behaviors in the response class (incorrect bat swings) which are not reinforced. This is known as *response differentiation;* the appropriate response in the response class has been differentiated.

How do we "polish" behaviors ?

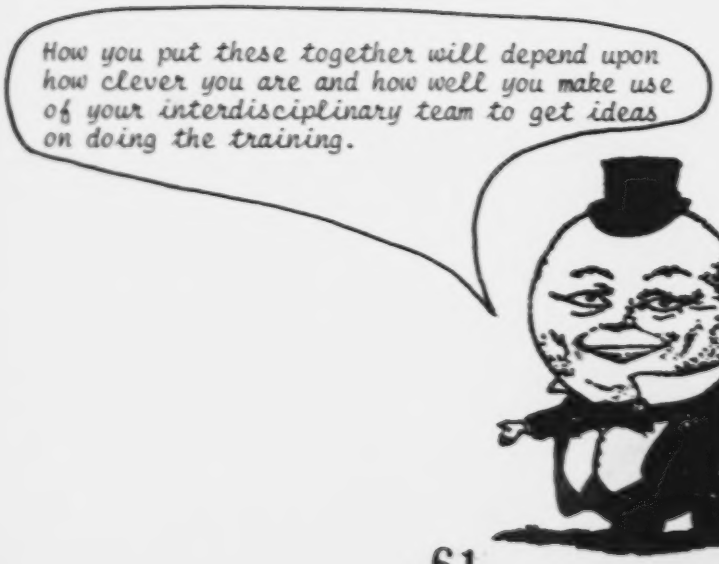


In reviewing all of the above, you have specific *strategies and techniques* that you can use in teaching new behaviors. We could make a list of these, with which you should now be familiar:


Prompting (verbal, physical, modelling)
Fading
Discrimination Training
Trial and Error
Fading of Redundant Stimuli
Easy-to-Hard Sequence
Delay of Prompts
Matching-to-Sample
Oddity
Shaping
Task Analysis
Forward Chaining
Total Task
Backward Chaining
Imitation Training
Generalization Training
Response Differentiation

You rarely will use only one of these techniques to teach a given task and usually will use most of them. They all work together:

You may develop a *task analysis* in order to *shape* a behavior and may use any of three types of *chains* (*forward, backward, total task*). You may need to use *prompts* (*verbal, physical, modelling*) and additionally *shaping* for various aspects of the chain, and will want to *fade* these prompts out. To facilitate this, you may need to do some *imitation training*, and may also need to do some *discrimination training* along the way. Finally, you will continue with *response differentiation* to polish the task, and if you're clever, you'll use *generalization training* all along.


How you put these together will depend upon how clever you are and how well you make use of your interdisciplinary team to get ideas on doing the training.

Self-Test #1

1. List three levels of prompting, the process, and purpose of each.

2. Answer the following as "True" or "False."

   ____ a. The primary way to teach new behaviors is to reinforce them.

   ____ b. A prompt occurs after a weak response in order to keep it going until it grows stronger.

   ____ c. A primary reason verbal prompts often don't work is because the instructions are not clear.

3. John is a client in a work activity center. You have instructed him on how to clean up his work area at the end of the day--but this has not worked. What prompt might you use next?

Self-Test #2

1. Why do we use a technique called "Fading"?

2. List the purpose of discrimination training and describe four approaches to discrimination training.

3. Answer the following as "True" or "False."

   ____ a. Fading is what happens to a response once reinforcement has been removed.

   ____ b. Fading of physical prompts is also known as graduated guidance.

   ____ c. Oftentimes, the problem with behaviors is that a certain stimulus is not serving as a discriminative stimulus.

   ____ d. "Fading of Redundant Stimuli" means getting rid of stimuli that are interfering with appropriate responses.

4. Joe is assigned to package utensils for airline meals. He is supposed to put one knife, one spoon, one salt packet, and one pepper packet into a plastic bag. Tell how you would design a match-to-sample program to help Joe.

Self-Test #3

1. What is the advantage of a shaping procedure?

2. Why is a task analysis beneficial in shaping?

3. List and describe 3 types of chaining.

4. How do you know if you are moving too slow or fast in shaping?

Self-Test #4

1. What is the difference between imitation training and generalization training?

2. How do we facilitate generalization?

3. What is response differentiation?

4. Answer the following as "True" or "False."

   ____ a. Imitation training and generalization training are basically the same thing--they get clients to repeat your general responses.

   ____ b. Response differentiation means "polishing" responses.

   ____ c. Response class means the area of the body (one of the five developmental areas) doing the response.